

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Cancelled)
2. (Currently Amended)      A method according to ~~claim 1~~claim 33, wherein said penalty function is responsive to a morphology of the cavity.
3. (Previously Presented)      A method according to claim 2, wherein said morphology comprises a width.
4. (Previously Presented)      A method according to claim 2, wherein said morphology is a local morphology.
5. (Currently Amended)      A method according to ~~claim 1~~claim 33, wherein said penalty function is responsive to the path.
6. (Previously Presented)      A method according to claim 5, wherein said penalty function is responsive to an amount of local bending of the path.
7. (Currently Amended)      A method according to ~~claim 1~~claim 33, wherein automatically determining a path comprises automatically determining a trajectory of an origin of a viewport.
8. (Currently Amended)      A method according to ~~claim 1~~claim 33, wherein providing a plurality of points comprises providing a trajectory.
9. (Currently Amended)      A method according to ~~claim 1~~claim 33, wherein automatically determining a path comprises automatically determining a trajectory of an aiming point.

10.- 24. (Cancelled)

25. (Currently Amended) A method ~~according to claim 1, of~~  
path planning, comprising:  
providing a medical imaging dataset representing a cavity and a  
boundary;  
providing a plurality of points in said dataset, including at least a  
starting point and an ending point;  
automatically determining a path between the starting point and the  
ending point, responsive to a penalty function defined by penalty values associated  
with passing through various points in the cavity; and  
~~comprising~~ selecting a data granularity level for said path  
determination.

26. (Currently Amended) A method according to ~~claim 1~~claim  
25, wherein automatically determining a path comprises evaluating a penalty  
function for the points.

27. (Previously Presented) A method according to claim 26,  
wherein said penalty function is dependent on the distance of the point from a  
boundary of the cavity.

28. (Previously Presented) A method according to claim 27,  
wherein said penalty function is lower for points which are further from the  
boundary.

29. (Currently Amended) A method ~~according to claim 28, of~~  
path planning, comprising:  
providing a medical imaging dataset representing a cavity and a  
boundary;  
providing a plurality of points in said dataset, including at least a  
starting point and an ending point; and

automatically determining a path between the starting point and the ending point, responsive to a penalty function defined by penalty values associated with passing through various points in the cavity, wherein automatically determining a path comprises evaluating a penalty function for the points, said penalty function being dependent on the distance of the point from a boundary of the cavity, and said penalty function being lower for points which are further from the boundary, wherein said penalty function has a substantial rate of increase when approaching said boundary.

30. (Currently Amended) A method ~~according to claim 28, of~~  
path planning, comprising:

providing a medical imaging dataset representing a cavity and a boundary;

providing a plurality of points in said dataset, including at least a starting point and an ending point; and

automatically determining a path between the starting point and the ending point, responsive to a penalty function defined by penalty values associated with passing through various points in the cavity, wherein automatically determining a path comprises evaluating a penalty function for the points, said penalty function being dependent on the distance of the point from a boundary of the cavity, and said penalty function being lower for points which are further from the boundary, wherein said penalty function has a low rate of change away from said boundary.

31. (Currently Amended) A method ~~according to claims 27, of~~  
path planning, comprising:

providing a medical imaging dataset representing a cavity and a boundary;

providing a plurality of points in said dataset, including at least a starting point and an ending point;

automatically determining a path between the starting point and the ending point, responsive to a penalty function defined by penalty values associated with passing through various points in the cavity, wherein automatically

determining a path comprises evaluating a penalty function for the points, said penalty function being dependent on the distance of the point from a boundary of the cavity; and

~~comprising~~ determining said distance by erosion of the dataset.

32. (Currently Amended) A method ~~according to claim 27, of~~  
path planning, comprising:

providing a medical imaging dataset representing a cavity and a boundary;

providing a plurality of points in said dataset, including at least a starting point and an ending point;

automatically determining a path between the starting point and the ending point, responsive to a penalty function defined by penalty values associated with passing through various points in the cavity, wherein automatically determining a path comprises evaluating a penalty function for the points, said penalty function being dependent on the distance of the point from a boundary of the cavity; and

~~comprising~~ determining said distance by wave propagation from the boundaries of said cavity.

33. (Currently Amended) A method according to ~~claim 1, of~~  
path planning, comprising:

providing a medical imaging dataset representing a cavity and a boundary;

providing a plurality of points in said dataset, including at least a starting point and an ending point; and

automatically determining a path between the starting point and the ending point, responsive to a penalty function defined by penalty values associated with passing through various points in the cavity, wherein said determining a path comprises determining a relatively short path.

34. (Previously Presented) A method according to claim 33, wherein a relatively short path comprises a shortest path which takes into consideration the penalty value associated with the various locations.

35. (Previously Presented) A method according to claim 33, wherein automatically determining a path comprises generating a graph representing at least a portion of the cavity.

36. (Previously Presented) A method according to claim 35, wherein said path is determined by applying a path finding method to the graph and wherein said portions of said graph are generated only when needed by said method.

37. (Previously Presented) A method according to claim 35, wherein automatically determining a path comprises determining a path using Dijkstra's shortest path finding method on said graph.

38. (Previously Presented) A method according to claim 35, wherein said graph includes only a subset of voxels in said cavity.

39. (Previously Presented) A method according to claim 38, wherein said graph comprises substantially only a skeleton of said cavity.

40. (Previously Presented) A method according to claim 39, wherein said skeleton is found utilizing data from erosion of the cavity, which erosion is utilized to determine a distance of interior points from said boundary.

41. (Currently Amended) A method according to ~~claim 1~~ claim 33, wherein said dataset is represented by voxels.

42. (Currently Amended) A method according to ~~claim 1~~ claim 33, wherein said boundary is represented by polygons.

43. (Currently Amended) A method according to ~~claim 1~~ claim 33, wherein said dataset comprises a CT dataset.

44. (Currently Amended) A method according to ~~claim 1~~ claim 33, wherein said dataset comprises an MRI dataset.

45. (Currently Amended) A method according to ~~claim 1~~ claim 33, wherein said dataset comprises a NM dataset.

46. (Currently Amended) A method ~~according to claim 1~~, of path planning, comprising:  
providing a medical imaging dataset representing a cavity and a boundary;  
providing a plurality of points in said dataset, including at least a starting point and an ending point; and  
automatically determining a path between the starting point and the ending point, responsive to a penalty function defined by penalty values associated with passing through various points in the cavity, wherein said boundary has small holes therein and wherein said path does not pass through holes narrower than a predetermined width.

47. (Previously Presented) A method according to claim 46, wherein said predetermined width is dependent on a morphology of the cavity.

48. (Cancelled)

49. (Cancelled)

50. (Currently Amended) A method ~~according to claim 48~~, of path planning, comprising the steps of:  
providing a medical dataset representing a cavity having a plurality of bends and a boundary;

providing a plurality of points in said dataset, including at least a starting point and an ending point; and

automatically determining a path between the starting point and the ending point, wherein said path does not remain substantially in a medical axis of the cavity and does not approach closer than a predetermined distance to said boundary, in at least two of said bends;

wherein said dataset is represented using voxels and wherein said path does not approach closer than three voxels to said boundary.

51. (Currently Amended) A method ~~according to claim 48, of~~ path planning, comprising the steps of:

providing a medical dataset representing a cavity having a plurality of bends and a boundary;

providing a plurality of points in said dataset, including at least a starting point and an ending point; and

automatically determining a path between the starting point and the ending point, wherein said path does not remain substantially in a medical axis of the cavity and does not approach closer than a predetermined distance to said boundary, in at least two of said bends;

wherein said dataset is represented using voxels and wherein said path does not approach closer than one tenth the local width of said cavity, to said boundary.

52. (Currently Amended) A method ~~according to claim 48, of~~ path planning, comprising the steps of:

providing a medical dataset representing a cavity having a plurality of bends and a boundary;

providing a plurality of points in said dataset, including at least a starting point and an ending point; and

automatically determining a path between the starting point and the ending point, wherein said path does not remain substantially in a medical axis of the cavity and does not approach closer than a predetermined distance to said boundary, in at least two of said bends;

wherein said dataset is represented using voxels and wherein said path does pass through holes in said boundary which are narrower than a predetermined width.

53. (Previously Presented) A method of simultaneously distance determining and skeletonizing a dataset including a cavity and a boundary thereof, comprising:

eroding said cavity, using a series balls of increasing radius  $R_i$ ;  
determining a distance of points interior to the cavity, from the boundary, utilizing said erosion;  
opening said eroded cavity, for each radius  $R_i$ , using a ball of radius 1; and  
accumulating the points which are removed from said eroded cavity by said opening, to form a skeleton.

54. (Previously Presented) A method according to claim 53, wherein erosion by a ball  $R$  comprises eroding the result of eroding with a ball of radius  $R-1$ , with a ball of radius 1.

55.-59. (Cancelled)

60. (Currently Amended) A method ~~according to claim 59, of~~ path planning, comprising the steps of:

providing a dataset representing a cavity and a boundary;  
providing a plurality of points in said dataset, including at least a starting point and an ending point; and  
automatically determining a path between the starting point and the ending point, responsive to a penalty function defined by penalty values associated with passing through various points in the cavity, wherein automatically determining a path comprises evaluating a penalty function for the points, wherein said penalty function is dependent on the distance of the point from a boundary of the cavity, and wherein said penalty function is lower for points which are further from the boundary.



61. (Currently Amended) A method ~~according to claim 55, of~~  
path planning, comprising the steps of:  
providing a dataset representing a cavity and a boundary;  
providing a plurality of points in said dataset, including at least a  
starting point and an ending point; and  
automatically determining a path between the starting point and the  
ending point, responsive to a penalty function defined by penalty values  
associated with passing through various points in the cavity, wherein said  
determining a path comprises determining a relatively short path.

62. (Previously Presented) A method according to claim 61,  
wherein a relatively short path comprises a shortest path which takes into  
consideration the penalty value associated with the various points.

63. (Previously Presented) A method according to claim 61,  
wherein automatically determining a path comprises generating a graph  
representing at least a portion of the cavity and wherein said path is determined by  
applying a path finding method to the graph and wherein said portions of said  
graph are generated only when needed by said method.

64. (Currently Amended) A method ~~according to claim 1, of~~  
path planning, comprising the steps of:  
providing a medical imaging dataset representing a cavity and a  
boundary;  
providing a plurality of points in said dataset, including at least a  
starting point and an ending point; and  
automatically determining a path between the starting point and the  
ending point, responsive to a penalty function defined by penalty values associated  
with passing through various points in the cavity, wherein said penalty function is  
responsive to an Euclidean distance of said various points from said boundary.

65. (Currently Amended) A method ~~according to claim 1, of~~  
path planning, comprising the steps of:  
providing a medical imaging dataset representing a cavity and a  
boundary;  
providing a plurality of points in said dataset, including at least a  
starting point and an ending point; and  
automatically determining a path between the starting point and the  
ending point, responsive to a penalty function defined by penalty values associated  
with passing through various points in the cavity, wherein said path planning  
allows a path to pass through two diagonally-adjacent voxels.

66. (Previously Presented) A method according to claim 25,  
wherein said granularity is determined responsive to a morphology of said cavity.

67. (Previously Presented) A method according to claim 66,  
wherein a local granularity is determined and wherein said morphology comprises  
a local morphology.

68. (Previously Presented) A method according to claim 67,  
wherein said local morphology comprises a local width.

69. (Previously Presented) A method according to claim 25,  
wherein a local granularity is determined and wherein said granularity is  
determined responsive to a distance of a locality from a cavity boundary.

70. (Previously Presented) A method according to claim 25,  
wherein a first granularity is determined for a first path planning and comprising  
repeating said path planning using a second granularity and using said first path as  
a starting point for said repeated path planning.